

Attorney's Docket No. 06618-662001
Appl. No. 09/900,743
Amendment dated September 5, 2003
Reply to Office Action dated May 7, 2003

Amendment to the Claims:

This listing of claims replaces all prior versions, and listings, of claims in the application:

1-6. (Cancelled)

7. (Currently Amended) A device as in claim 1, A device,
comprising:

a substrate; and
a surface micromachined pressure sensor, formed on said
substrate, and formed to be capable of sensing pressures that
are greater than 6000 psi; and

wherein said pressure sensor includes a diaphragm material, formed of a material with fracture strain greater than a predetermined amount, and Young's modulus greater than a predetermined amount, and a plurality of strain sensitive resistors, formed in said diaphragm material.

8. (Original) A device as in claim 7, wherein said strain sensitive resistors are piezoresistors.

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9. (Currently Amended) A device as in claim [[1]] 7,
wherein said surface micromachined pressure sensor is capable of
sensing pressures greater than or equal to 10,000 PSI.

Cl Cr
10. (Original) A device as in claim 8, further comprising
a vacuum cavity, under said diaphragm material, said cavity
having a depth that is based on overpressure protection
characteristics.

11. (Original) A device as in claim 10, wherein said
depth of said cavity is substantially equal to an amount of
deflection of the diaphragm at a specified maximum pressure.

CN
12. (Currently Amended) A device as in claim 5, A device,
comprising:
a substrate; and
a surface micromachined pressure sensor, formed on said
substrate, and formed to be capable of sensing pressures that
are greater than 6000 psi;
wherein said surface micromachined pressure sensor includes
a diaphragm layer, formed from a silicon nitride layer; and

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C2
Cr
C3

further comprising at least one additional resistor, formed on an area other than said diaphragm layer, but formed on said substrate, said at least one additional resistor being sized to compensate for an offset voltage.

13. (Original) A device as in claim 12, wherein said surface micromachined pressure sensor includes a diaphragm, and further comprising a dummy diaphragm having at least one similar characteristic to said diaphragm.

14. (Original) A device as in claim 13, wherein said at least one additional resistor is formed on said dummy diaphragm.

15-27. (Canceled)

Cel

28. (Original) A device as in claim 7, wherein said strain sensitive resistors have a size less than one third of a radius of said diaphragm.

29-32. (Canceled)

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33. (Previously Presented) A device, comprising:
a substrate; and
CS
a surface micromachined pressure sensor, having a
deformable membrane formed adjacent said substrate, said
membrane having an outer size from edge to edge which is less
than 100 microns, and having a thickness that is capable of
withstanding a pressure that is greater than at least 6000 psi.

Cl
34. (Original) A device as in claim 33, further
comprising a plurality of strain sensitive resistors, formed
within said membrane.

C1
35. (Previously Presented) A device as in claim 33,
wherein said surface micromachined pressure sensor element
includes a silicon nitride layer.

CS
36. (Original) A device as in claim 35, wherein said
membrane is formed of a plurality of layers.

37. (Original) A device as in claim 36, wherein each of
said plurality of layers includes silicon nitride.

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38. (Original) A device as in claim 36, wherein at least one of said plurality of layers includes silicon nitride, and another of said layers includes polysilicon.

39. (Original) A device as in claim 33, wherein said membrane has a thickness that allows it to withstand a pressure of at least 10,000 P.S.I.

40. (Original) A device as in claim 33, wherein said membrane is attached to said substrate along an outer periphery thereof, and also at a center thereof.

41. (Original) A device as in claim 33, further comprising a vacuum cavity, under said diaphragm material, said cavity having a depth that is based on desired overpressure protection characteristics.

42. (Original) A device as in claim 41, wherein said depth of said cavity is substantially equal to an amount of deflection of the diaphragm at a specified maximum pressure.

43. (Previously Presented) A device as in claim 34, further comprising at least one additional resistor, formed on a

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part of said substrate other than said membrane, said at least one additional resistor being sized to compensate for an offset voltage.

*M80
crd*
44. (Original) A device as in claim 34, wherein said resistors are formed of polysilicon.

45. (Original) A device as in claim 34, wherein said resistors are formed of platinum.

46. (Original) A device as in claim 33, further comprising a capacitive sensor, sensing an amount of deflection of said diaphragm.

C
47-59. (Canceled)

C
60. (Original) A device, comprising:
a substrate;
a deformable diaphragm, coupled to said substrate, and connected at least around a perimeter thereof to said substrate, and separated from said substrate to form a cavity under said diaphragm between said diaphragm and said substrate, said deformable diaphragm having an outer perimeter size which is

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less than 100 microns, and having a thickness which is greater than three microns.

M
X
CW

61. (Previously Presented) A device as in claim 60, wherein said substrate includes a peg portion at an area near a center of said diaphragm, and wherein said diaphragm portion is also connected to said extending portion.

62. (Original) A device as in claim 60, wherein said diaphragm is formed of a plurality of layers.

63. (Original) A device as in claim 62, wherein at least one of said layers is formed of silicon nitride.

64. (Original) A device as in claim 63, wherein at least one of said layers is formed of polysilicon.

65. (Currently Amended) ~~A device as in claim 1, further comprising a device, comprising:~~

a substrate; and

a surface micromachined pressure sensor, formed on said substrate, and formed to be capable of sensing pressures that are greater than 6000 psi;

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[REDACTED] an over pressure protection part, integral with said device, and protecting said device against pressures which are higher than a designed-for specified amount.

MS end
66. (Previously Presented) A device as in claim 65, further comprising a diaphragm layer, and a vacuum chamber under said diaphragm layer, and wherein said over pressure protection part is formed by a depth of said vacuum chamber which limits an allowable deflection of said diaphragm layer.

67. (Previously Presented) A device as in claim 65, further comprising a diaphragm layer, and a vacuum chamber under said diaphragm layer, with a post in a substantially central area of said vacuum chamber, limiting a deflection of said diaphragm layer.